

The Examiner will note that Xu, having stated that the photomask exposure "may include contact, proximity, and projection techniques" provides no further description of the method of application of the proximity method versus the contact method. Indeed, one of skill in the art in possession of Xu could not conclude anything but that the various methods are fully equivalent.

That this is not the case is clear from the instant application. For example, on pages 2 and 3 of the instant application is presented a discussion of the various requisites for handling photopolymerizable materials in the fabrication of waveguides, particularly the acrylates preferred in the instant application. It is stated that oxygen concentration must be carefully controlled, and that, furthermore the viscosity of the photopolymerizable material is low and the film thereof easily disturbed. For these reasons, it is stated on page 3 lines 3-4 "the use of a direct contact UV transparent cover cannot be readily employed."

Furthermore, unlike Xu, the instant application teaches the method by which the non-contact photomask is properly employed to obtain the desired result. The teachings on Page 7 of the instant invention make clear the importance of thoroughly deoxygenating the materials therein employed. As has already been stated, the use of a contact photomask can interfere with proper deoxygenation. On Page 7 line 21 – Page 8 line 1 of the instant application – it is described how the photomask is held 500 micrometers or more away from the surface during deoxygenation, and then is lowered to no more than 20 micrometers, preferably more than 5 micrometers from the surface for exposure. Nowhere in Xu is there any teaching whatever in this regard. One in possession of Xu would need to experiment with photomask to surface distance in order to arrive at the proper working distance.

Thus Xu does not enable anything except contact photomask exposure with all its concomitant problems. Xu cannot be considered as prior art for non-contact photomask because of the absence of critical teaching.

In like manner, Xu merely mentions the use of a buffer layer whereas the instant invention is limited thereto. Xu provides absolutely no teaching in regard to how to select the buffer material nor how to prepare the buffer material. In contrast, the instant invention provides a detailed discussion on Page 10 line 14

– Page 12 line 21 of the buffer layer, its function, and how to select the material and fabricate the layer. Thus on Page 11 line 17 of the instant invention it is stated “The difference between the index of the core and the buffer is desired to be greater than about 1.5 times Δn ...” where Δn is the difference between the refractive indices of the core and cladding. Xu provides no such instructions.

On Page 11 line 25 – Page 12 line 2 is provided detailed teaching regarding buffer layer thickness. Then is followed detailed teaching about buffer layer curing. None of these teachings are provided in Xu. Thus, in regard to the buffer layer, Xu provides insufficient teaching to enable one of skill in the art to arrive at the instant invention by ordinary methods. Xu cannot be considered prior art for a buffer layer because of the absence of the critical teaching.

CONCLUSION

In light of the above arguments, Applicant respectfully asserts that Xu is not suitable as prior art for the instant invention because of a failure to meet the requirements of 35 U.S.C. §112 in regard to two limitations in the instant claims, namely the use of non-contact photomask and the use of a buffer layer. One of ordinary skill in the art would need to employ greater than ordinary methods to arrive at the instant invention, and would not by virtue of Xu be placed in possession of the instant invention. Xu cannot be said to have been in possession of the instant invention absent the critical teaching provided in the instant invention. Therefore the claims in the instant invention stand as patentably novel over the cited art. Allowance of Claims 1-10 and 12-33 is respectfully solicited.

Respectfully submitted,

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